

Trend Study 3-18-01

Study site name: Geertsen Canyon.

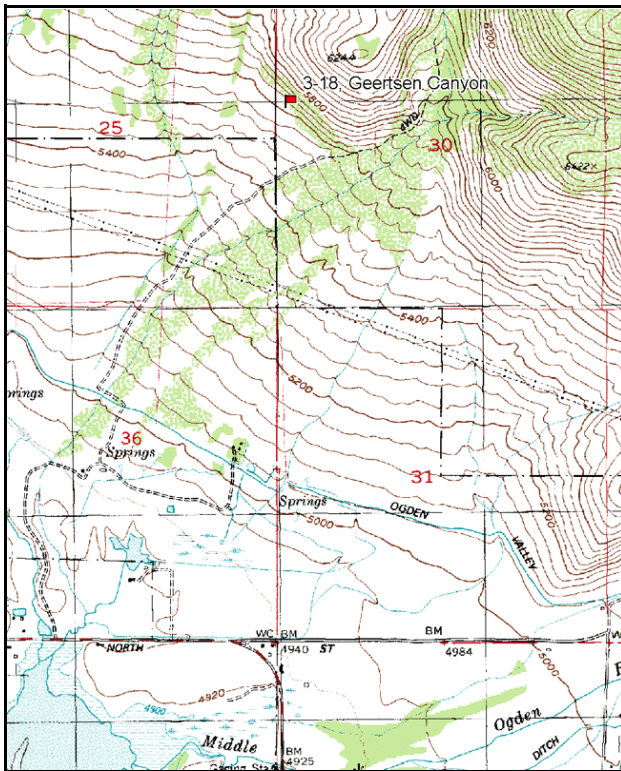
Vegetation type: Big Sagebrush-Grass.

Compass bearing: frequency baseline 161 degrees magnetic.

Frequency belt placement: Line 1 (11 & 95ft), line 2 (34ft), line 3 (71ft), line 4 (59ft). Rebar: belt 1 on 1 ft., belt 2 on 0 ft., belt 3 on 2 ft., no rebar on belt 4, belt 5 on 3 ft.

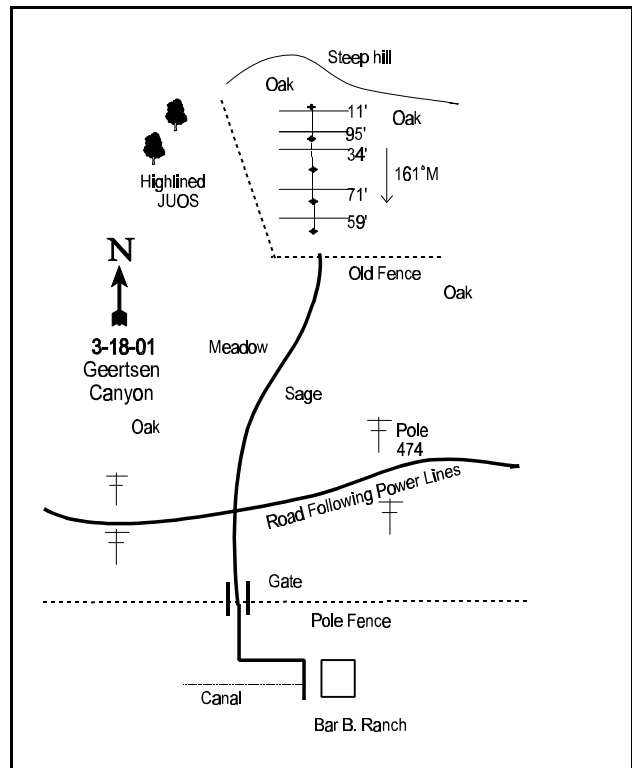
LOCATION DESCRIPTION

Contact Bill Hadlock before doing this site. From the intersection of 5500 East and 2200 North in Eden, go south for 0.35 miles, then turn left and go 0.75 miles east to the Huntsville Stake Center. Continue east 0.2 miles to the gate of Bar B Ranch. Turn left through the gate and go 0.9 miles north up the ranch road past a farm house on the left to another gate. Park here and walk through this gate 0.2 miles to a road along a canal. Turn left and walk 0.1 miles north to a dirt road, then turn right and go 0.55 miles to the high tension power lines. Just to the east is power pole # 474. From pole 474, walk 1/3 of a mile at 11 degrees magnetic to the 0-foot baseline stake. The 0-foot baseline is marked by a 4-foot rebar stake (tagged #7026) located 100 feet down from the oak edge and 100 feet southwest of a large maple. The baseline runs 161 degrees magnetic.



Map Name: Huntsville

Township 7N, Range 2E, Section 30



Diagrammatic Sketch

UTM 4573966 N 435053 E

DISCUSSION

Trend Study No. 3-18

The Geertsen Canyon study samples a mountain big sagebrush/grass community located on a hillside north of the mouth of Geertsen Canyon. This study is on the Wolf Creek conservation easement that is managed by the DWR for wildlife and recreation. The site lies on a moderately steep, 25% slope with a southwest aspect. Elevation is approximately 5,500 feet. The area has been heavily grazed by horses and cattle in the past, but current livestock use is light. Livestock use was estimated at 3 cow days use/acre (7 cdu/ha) from pellet group transect data taken in 2001. The Geertsen Hollow area is known for wintering concentrations of deer. The permanent nearby pellet group transect has measured high levels of use in the past. The average from 1980-85 was 39 deer days use/acre (97 ddu/ha) the highest on the herd unit (Jense et al. 1985). Two deer antlers and one large elk antler were found on the site during the 1985 reading. In 1996, elk pellets were sampled in moderate amounts (27% quadrat frequency), while that of deer showed low quadrat frequencies (4%). In 2001, pellet group transect data estimated 13 elk days use/acre (31 edu/ha) and 15 deer days use/acre (36 ddu/ha). Wild turkeys were sited on the hike into the study in 2001.

Soils in the area are formed from a weathered conglomerate of sandstone and quartzite. The soil is deep and well-drained but permeability is slow due to clay in the subsoil (USDA 1980). Soils at the site are extremely rocky on the surface and throughout the profile. Due to the rocky nature of the soil, effective rooting depth (see methods) was estimated at less than 6 inches. Soil on the site has a sandy clay loam to clay loam texture and is slightly acidic in reactivity (pH of 6.2). The hazard of erosion is high if unprotected, but the area has an adequate covering of vegetation and litter. An erosion condition classification determined soils to be in stable condition in 2001. Rocks and pavement make up 14% of the surface cover. Due to the shallow, rocky nature of the soil profile, soil temperature was extremely high at nearly 80°F in 1996. Temperatures this high often indicate vulnerability to weed invasion as well as difficulty in shrub reproduction. This site suffers from both of these problems.

Mountain big sagebrush is the only important browse species present on this site. Density of mountain big sagebrush was estimated at 1,860 plants/acre in 1996, which is relatively sparse for mountain big sagebrush. In 2001, density decreased to an estimated 1,020 plants/acre. Most of this decrease is due to the loss of young plants in the population since 1996. Young sagebrush plants were very abundant in 1996 (1,140 plants/acre) but no young plants were sampled in 2001. Sagebrush reproduction will be difficult on this site in the future due to the shallow, rocky soils with high temperatures and drought conditions. Percent decadency, also influenced by drought, increased from 6% in 1996 to 16% in 2001. However, this is still low for sagebrush. Use is light to moderate as vigor has been generally normal throughout most of the population in 1996 and 2001. Mountain big sagebrush exhibits a rather low growth form at this site, most likely due to the shallow, rocky soils. Mature sagebrush average 1½ feet tall by 2 feet wide. Between 1996 and 2001, sagebrush also decreased in strip frequency from 41 to 30. Average leader growth was 2.5 inches in 2001.

Oak and maple are found further up the slope and along the creek. Some of the oak and junipers nearby have been high-lined. Broom snakeweed was picked up in the larger sample used in 1996. Density was estimated at 740 plants/acre in 1996, but no snakeweed plants were sampled in 2001. Snakeweed densities can fluctuate with changes in precipitation which appears to be the case at this site with drought conditions of the past 2 years (2000-2001).

The herbaceous vegetation accounts for most of the cover on the site. However, composition is extremely poor. Bulbous bluegrass has been the most abundant perennial grass in all sampling years. This species accounted for 77% of the grass cover in 1996, increasing to 90% in 2001. This species was sampled in nearly every quadrat in all readings. Currently ('01) it provides over 42% average cover. Bulbous bluegrass can

provide early spring forage and fair erosion control. However, like cheatgrass, it dries up early in the season and can become a fire hazard. It also forms a dense mat when abundant and becomes highly competitive with desirable perennials, including shrubs. Other, more high-yielding, long-lived perennial species are present in very low numbers. These species include bluebunch wheatgrass, thickspike wheatgrass, Kentucky bluegrass and Letterman needlegrass. Annual brome grasses, especially Japanese brome, were very abundant in 1996. Japanese brome significantly decreased in nested frequency in 2001, providing less than half of the cover it did in 1996.

Forb composition is extremely poor. Many of the more common forbs are considered weeds, although they may provide some big game forage in the spring. Weedy increasers include ragweed, pacific aster, tarweed, curlycup gumweed, yellow salsify and moth Mullen. These species accounted for 81% of the forb cover in 1996. The noxious weed, Dyers woad, is also present in small numbers. Sum of nested frequency for perennial forbs decreased by nearly half between 1996 and 2001. Annual forbs are very abundant, especially storksbill, which increased 10-fold in nested frequency and provides 16% average cover in 2001. Other annual species, most notably tarweed, were abundant in 1996, but significantly decreased in 2001. It was reported in the 1985 that caterpillars and grasshoppers did considerable damage to the herbaceous vegetation that summer. In 1996, some of the yellow salsify had been utilized, most likely by elk.

1985 APPARENT TREND ASSESSMENT

The vegetative trend appears to be upward in terms of deer winter range. The sagebrush is increasing and there is a dense stand of bulbous bluegrass. Livestock grazing should be restricted as dense grasses are abundant and interfere with sagebrush seedling establishment. A rest from grazing will allow the more palatable and desirable species to recover and compete with the invader species that are present.

1990 TREND ASSESSMENT

Mountain big sagebrush displays characteristics of a downward trend on this winter range. Compared to 1985, there are significantly fewer young sagebrush and a large increase in the percentage of decadent plants which has gone from 10% to 77%. Increased decadency, reduced vigor, and low growth is due mostly to moisture stress. Bulbous bluegrass forms an almost complete ground cover. Other grasses are relatively uncommon.

TREND ASSESSMENT

soil - stable (3)

browse - down (1)

herbaceous understory - down, poor condition because of the very high densities for the increaser, bulbous bluegrass (1)

1996 TREND ASSESSMENT

Trend for soil is up due to a large decline in percent bare ground from 12% to 1%. Litter cover declined but this is likely due to misidentification of dried up bulbous bluegrass as litter cover instead of vegetation cover. There is currently no erosion problem on the site due to abundant vegetation and litter cover. Trend for mountain big sagebrush is up due to an increase in density, a decline in decadence, and an improvement in vigor. The stand contains an adequate number of seedlings and abundant young plants. Utilization is currently light to moderate. The herbaceous understory trend is stable. However, composition is extremely poor. The grass component is dominated by bulbous bluegrass and annual brome grasses which combine to produce 97% of the grass cover. Sum of nested frequency for perennial grasses is similar to 1990 estimates. The forb composition is also poor with undesirable weeds being dominate. It appears that tarweed was

present in 1985, but was identified as an unknown forb. In 1990, tarweed was likely present but not counted because it is an annual. Sum of nested frequency of perennial forbs has increased dramatically. However, due to the poor composition, trend is considered down slightly.

TREND ASSESSMENT

soil - up (5)

browse - up (5)

herbaceous - down slightly due to increasingly poor composition (2)

2001 TREND ASSESSMENT

Trend for soil is stable. Erosion remains minimal with a dense mat of bulbous bluegrass protecting the ground surface. Very little bare ground exists on the site. Trend for the key browse, mountain big sagebrush, is slightly down. Recruitment from young plants decreased from 61% in 1996 to 0% in 2001. Strip frequency of sagebrush decreased from 41% to 30%, and percent decadency increased slightly to 16%. A decline in strip frequency is due most likely to the loss of young plants in the population which is a result of drought and high competition from the abundant and weedy understory. Better precipitation in the future may help increase the number of young plants somewhat, but the young plants will likely have a difficult time persisting at the site due to the dominance of bulbous bluegrass. Trend for the herbaceous understory is stable, but remains in poor condition as bulbous bluegrass continues to dominate the site. Desired perennial grasses are present in low abundance, but will likely not increase. Forbs are dominated by annuals and weedy perennials. Annual grasses and perennial forbs did decrease in sum of nested frequency, but the dominance of bulbous bluegrass counteracts this.

TREND ASSESSMENT

soil - stable (3)

browse - slightly down (2)

herbaceous understory - stable, but remains in poor condition (3)

HERBACEOUS TRENDS --
Herd unit 03 , Study no: 18

T y p e	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'85	'90	'96	'01	'85	'90	'96	'01	'96	'01
G	Agropyron dasystachyum	3	-	1	-	1	-	1	-	.00	-
G	Agropyron spicatum	a-	b11	ab2	ab5	-	5	2	2	.18	.44
G	Bromus japonicus (a)	-	-	b328	a211	-	-	96	80	8.00	3.34
G	Bromus tectorum (a)	-	-	b29	a9	-	-	10	5	.29	.07
G	Danthonia californica	-	-	-	4	-	-	-	2	-	.06
G	Poa bulbosa	b366	a355	ab365	ab361	98	100	98	99	32.20	42.65
G	Poa pratensis	a-	a-	a5	b15	-	-	2	6	.03	.08
G	Poa secunda	a5	b14	b14	b18	2	6	5	7	.02	.40
G	Stipa lettermani	a-	a-	b28	a11	-	-	12	4	.96	.42
Total for Annual Grasses		0	0	357	220	0	0	106	85	8.29	3.42
Total for Perennial Grasses		374	380	415	414	101	111	120	120	33.41	44.06
Total for Grasses		374	380	772	634	101	111	226	205	41.71	47.48
F	Achillea millefolium	a12	ab13	b32	ab14	5	6	13	8	.38	.31
F	Agoseris glauca	1	5	3	1	1	2	1	1	.00	.00
F	Allium spp.	12	-	-	-	5	-	-	-	-	-
F	Ambrosia psilostachya	b97	a11	b125	b102	34	6	46	42	2.45	1.58
F	Artemisia ludoviciana	39	24	35	41	16	12	15	18	.79	1.74
F	Aster chilensis	a-	b121	c199	b170	-	49	69	64	4.63	3.09
F	Calochortus nuttallii	-	-	-	-	-	-	-	-	-	.00
F	Cirsium spp.	-	-	2	-	-	-	1	-	.00	-
F	Collomia linearis (a)	-	-	10	6	-	-	3	3	.21	.04
F	Comandra pallida	-	-	-	3	-	-	-	1	-	.03
F	Crepis acuminata	-	-	-	-	-	-	-	-	-	.03
F	Epilobium brachycarpum (a)	-	-	a-	b41	-	-	-	16	-	.10
F	Erodium cicutarium (a)	b19	a-	b29	c301	8	-	12	92	.23	16.00
F	Erigeron strigosus	b10	a-	ab3	b10	4	-	2	6	.03	.05
F	Eriogonum umbellatum	-	1	-	-	-	1	-	-	-	-
F	Grindelia squarrosa	a-	a1	b30	a-	-	1	12	-	.50	-
F	Isatis tinctoria	-	-	1	-	-	-	1	-	.06	-
F	Lappula occidentalis (a)	-	-	b19	a-	-	-	9	-	.21	-
F	Lactuca serriola	a-	a-	b45	b66	-	-	21	30	.20	1.44
F	Lomatium spp.	-	5	1	6	-	3	1	3	.00	.18
F	Machaeranthera canescens	a-	a-	b190	a-	-	-	71	-	1.07	-
F	Madia glomerata (a)	-	-	b269	a55	-	-	91	24	3.99	.24

T y p e	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'85	'90	'96	'01	'85	'90	'96	'01	'96	'01
F	Melilotus alba	-	-	-	3	-	-	-	1	-	.03
F	Phlox longifolia	-	-	-	2	-	-	-	1	-	.00
F	Polygonum douglasii (a)	-	-	2	-	-	-	1	-	.00	-
F	Ranunculus testiculatus (a)	-	-	-	2	-	-	-	1	-	.00
F	Rumex crispus	-	-	2	1	-	-	1	1	.03	.04
F	Taraxacum officinale	-	-	-	4	-	-	-	2	-	.01
F	Tragopogon dubius	_b 26	_a 5	_c 126	_b 12	15	2	57	7	1.43	.11
F	Unknown forb-perennial	_b 337	_a -	_a -	_a -	120	-	-	-	-	-
F	Verbascum blattaria	_a 3	_a -	_b 33	_{ab} 16	1	-	16	7	.79	.20
Total for Annual Forbs		19	0	329	405	8	0	116	136	4.65	16.39
Total for Perennial Forbs		537	186	827	451	201	82	327	192	12.40	8.88
Total for Forbs		556	186	1156	856	209	82	443	328	17.06	25.28

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --

Herd unit 03 , Study no: 18

T y p e	Species	Strip Frequency		Average Cover %	
		'96	'01	'96	'01
B	Artemisia tridentata vaseyana	41	30	2.25	2.86
B	Gutierrezia sarothrae	12	0	.24	-
Total for Browse		53	30	2.49	2.86

BASIC COVER --

Herd unit 03 , Study no: 18

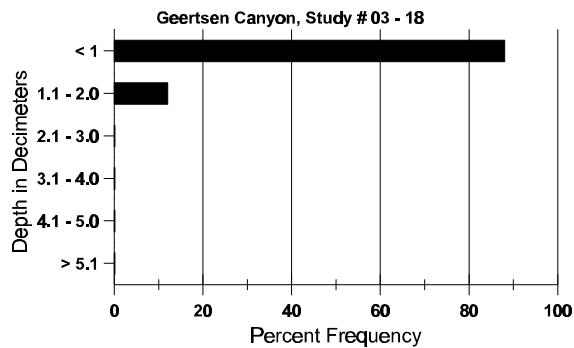
Cover Type	Nested Frequency		Average Cover %			
	'96	'01	'85	'90	'96	'01
Vegetation	389	380	16.75	7.75	62.06	70.66
Rock	218	210	11.25	10.25	11.92	13.47
Pavement	146	108	4.25	4.25	.96	.93
Litter	384	341	48.50	65.50	35.29	32.29
Cryptogams	7	-	1.00	.25	.04	0
Bare Ground	139	103	18.25	12.00	1.08	1.07

SOIL ANALYSIS DATA --

Herd Unit 03, Study no: 18, Geertsen Canyon

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
5.6	79.8 (4.22)	6.2	44.7	27.0	28.3	3.0	14.5	153.6	.6

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 03 , Study no: 18

Type	Quadrat Frequency		Pellet Transect	
	'96	'01	Pellet Groups per Acre '01	Days Use per Acre (ha) '01
Elk	27	2	165	13 (31)
Deer	4	11	191	15 (36)
Cattle	4	7	35	3 (7)

BROWSE CHARACTERISTICS --

Herd unit 03 , Study no: 18

Herb Unit 05, Study No. 18																		
A G R E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia tridentata vaseyana																		
S	85	1	-	-	-	-	-	-	-	-	1	-	-	-	66		1	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	85	7	1	-	-	-	-	-	-	-	8	-	-	-	533		8	
	90	1	1	-	-	-	-	-	-	-	2	-	-	-	133		2	
	96	51	-	-	6	-	-	-	-	-	57	-	-	-	1140		57	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	85	19	-	-	-	-	-	-	-	-	19	-	-	-	1266	19 22	19	
	90	1	1	-	-	-	-	-	-	-	2	-	-	-	133	12 16	2	
	96	9	18	3	-	-	-	-	-	-	27	-	3	-	600	18 38	30	
	01	15	28	-	-	-	-	-	-	-	42	1	-	-	860	17 24	43	
D	85	3	-	-	-	-	-	-	-	-	2	-	1	-	200		3	
	90	11	2	-	-	-	-	-	-	-	1	-	-	12	866		13	
	96	4	2	-	-	-	-	-	-	-	3	-	1	2	120		6	
	01	6	1	1	-	-	-	-	-	-	5	-	-	3	160		8	
X	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	260		13	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	100		5	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		03%			00%			03%			-43%							
'90		24%			00%			71%			+39%							
'96		22%			03%			06%			-45%							
'01		57%			02%			06%										
Total Plants/Acre (excluding Dead & Seedlings)												'85	1999	Dec:	10%			
												'90	1132		77%			
												'96	1860		6%			
												'01	1020		16%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Gutierrezia sarothrae																		
S	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	3	-	-	-	-	-	-	-	-	3	-	-	-	60		3	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	96	9	-	-	-	-	-	-	-	-	9	-	-	-	180		9	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	85	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	96	28	-	-	-	-	-	-	-	-	28	-	-	-	560	11	28	
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'85		00%			00%			00%										
'90		00%			00%			00%										
'96		00%			00%			00%										
'01		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'85	0	Dec:	-			
												'90	0		-			
												'96	740		-			
												'01	0		-			